



Los Alamos National Laboratory's Discreet Oculus team recognized in DTRA's Hyper Critical Campaign

August 28, 2018

The Defense Threat Reduction Agency's (DTRA) Hyper Critical Campaign, with major support from Los Alamos National Laboratory (LANL), was recognized in June with a Department of Defense Value Engineering Achievement Award. DTRA designated LANL to lead this complex, multi-agency Campaign that went from inception to successful execution in seven months.

As the technical lead, the Laboratory was responsible for overall program planning, coordination and execution as well as significant technical development supporting the effort. The Lab's contributions were accomplished through the Discreet Oculus (DO) team under the watch of Cheng Ho of the Intelligence and Space Research Division, Space and Remote Sensing group. The Hyper Critical Campaign team was recognized for leveraging the Fast Burst Reactor (FBR) to successfully execute a complex test series designed to demonstrate the U.S. Prompt Diagnostics capability to measure nuclear reaction history. To meet the scientific objective, this Campaign operated the FBR in two different non-standard configurations, including a unique configuration that has not been exercised for decades. By doing so, the team realized a significant cost savings through innovative scientific and engineering practices.

The Lab's Discreet Oculus team is a component of the larger Hyper Critical Test team, and is comprised of scientists and engineers from the Lab's Intelligence and Space Research Division, Applied Engineering and Technology, Accelerator Operations and Technology and X Computational Physics. This team designed and developed the RF sensor suite and the algorithms utilized by the suite, and established a common simulation framework to model signal propagation for all relevant physics and geometry. In addition to DTRA and the Lab, other Hyper Critical Test team members include participants from the Air Force, Office of the Secretary of Defense, Sandia and Lawrence Livermore national laboratories, Aberdeen Proving Ground, the United Kingdom's Atomic Weapons Establishment (AWE) and Applied Research Associates, Inc. (ARA).

The Hyper Critical Campaign was hosted by White Sands Missile Range (WSMR). The project utilized WSMR's Fast Burst Reactor, a sister machine to the Godiva IV located at the National Criticality Experiments Research Center in Nevada. In addition to being the technical lead of the entire Campaign, the Laboratory designed and fielded RF instrumentation and performed applicable modeling. Sandia National Lab

provided optical sensors and Lawrence Livermore provided gamma ray sensors for the tests. Overall, the Lab led the group to execute all design, development and test in an extremely short seven-month timeframe from kickoff to completion. A trial run, to validate the Campaign's basic design, was held in April and full tests were conducted in June 2017. All tests were deemed successful and lauded by DOD.

The Hyper Critical Campaign is part of the Validation and Verification test series for DO. The Discreet Oculus sensor array is to be installed in and around major U.S. cities and has the ability to capture key forensic data should a nuclear event occur. The array, which DTRA continues to develop, would record radiation and seismic-acoustic waves emanating from a nuclear blast. The sensor suite will be transferred to the U.S. Air Force as the ultimate operator.

The Value Engineering Achievement Award dates back to our Nation's eighty-fourth Congress when in 1954 they established the Value Engineering Office in the Navy's Bureau of Ships. Engineers assigned to this office had the mission to "seek out suppliers who have developed special processes and techniques for building good equipment at low cost." The focus on economic innovation and value proposition has not changed.

A ceremony took place in the Pentagon auditorium on June 28 where the awards were presented. Watch the [Value Engineering Achievement Awards Ceremony](#) online.

See more on the [Department of Defense's Honorary Value Engineering Awards Program webpage](#).

Caption for image below: A subset of the HYPHER CRITICAL team pose for a photo in New Mexico.

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